



# NATURAL RESOURCES AND SHORELINE

## 8.1 INTRODUCTION AND ANALYSIS

The natural resources of the island of Hawaii are the physical and environmental assets that are recognized as useful, valuable, and desirable. These natural resources include, but are not limited to, the land, water, air, flora, fauna, soils, geologic features, geothermal steam, climate, wind, sunshine, ocean waters, and shoreline. Some of these resources are finite and irreplaceable. However, several are replaceable at extreme cost and others are renewable. The island's growing population and expanding urbanization places a greater demand on the limited resource base. Thus, in order to conserve these resources, best management practices and enforcement of zoning and environmental laws are critical. Some of these resources have been covered in other sections in the General Plan.

Largest and youngest of the Hawaiian Chain, the island of Hawaii covers a land area of 4,028 square miles with 4.4 square miles of inland water bodies, and is still growing. The Big Island, as it is known today, was formed by five volcanoes and three - Mauna Loa, Hualalai, and Kilauea, are still active. Extensive scientific research on active volcanic processes is being conducted. This is the only place in the United States where such processes can be continuously studied. Land and marine volcanic regions are also possible sources of geothermal energy. At 13,796 feet above sea level, Mauna Kea is the tallest of the island's mountains. The topography of the island extends from craggy ocean cliffs and beaches of black, green and golden sand to snow-covered mountain peaks during the winter months. Vegetative cover generally corresponds with elevation and ranges from tropical rainforest to grazing land to barren lava fields. Leeward and windward directions are equally important in determining vegetation types and landscape characteristics. In some windward areas, rainfall reaches an average of 300 inches annually, while some leeward areas have virtually no rainfall throughout the year.

Temperature drops consistently with higher elevation. Coastal regions are warm and semi-tropical, while frost is not unusual above the 4,000-foot level. The purity of atmospheric conditions at higher elevations has attracted scientific research. Fresh and marine waters are important to the County. Potable water is an understood necessity. The marine waters of the island and the plant and animal life within them are of dietary, recreational, and scientific importance.

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The soils of the County consist of various forms and stages of volcanic lava and ash. The young age and form of some lava make certain areas temporarily non-productive.

Throughout the island, there are pockets of endemic vegetation. These are important botanical remnants with scientific significance and are part of our natural heritage. Forest areas of both native and introduced species are additionally important as watershed areas and as natural means of controlling erosion. The flora and fauna, both native and introduced, are used as nutritional and recreational resources by numerous residents.

The island has more than 305 miles of coastline, but approximately 75 per cent is comprised of cliffs of varying height. The porous nature of the lava flows have produced unique ecological niches in the anchialine ponds along the coast. The coastline can be divided into seven general areas.

The Hamakua coast, from near Waipio Valley to Hilo Bay, is comprised of a sea cliff 100 to 300 feet high. Along the Hamakua Coast are boulder beaches that have formed at the mouths of valleys and the numerous gulches. From Hilo to Leleiwi Point to Keaau, the rocky shoreline of the Hilo coast is highly irregular.

The Puna coast from Keaau along Cape Kumukahi to Kalapana is partly low sea cliff and partly the constructional surface of recent lava flows. The irregularity of the coast a few miles to either side of Pohoiki is the result of several earthquakes and subsidence. There are also black sand beaches on the Puna coast that were created when hot molten lava reached the ocean, solidified, and shattered in the surf.

The coast of Ka'u and South Kona varies in composition and height. Sections are formed of soil, other areas are pahoehoe benches or a'a cliffs of varying height. The cliffs are especially high where the major sets of faults are close to and parallel to the sea. Several cones are present along the shoreline and some have adjacent black sand beaches.

The low coastline of North Kona extends north from the end of the fault-controlled sea cliff of Kealakekua Bay to Kawaihae Harbor. Like the northern Puna coast, the shoreline is highly irregular with sea cliffs a few feet high. There are also pocket beaches found along bays between adjacent flows. The best beaches on the island are along the coast between Kailua-Kona and Kawaihae.

The west and north slopes of the Kohala volcano from north of Kawaihae to Pololu Valley are marked by sea cliffs of moderate to low height. The coastal cliffs are interrupted by pockets of boulder beaches at the mouths of the intermittent gullies and small streams.

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The coastline along the windward deep valleys between Pololu and Waipio alternates between steep cliffs rising as high as 1,400 feet and boulder or sand beaches fronting the deep valleys.

The State's Shoreline Setback statute was passed in 1970. It established a restrictive zone 40 feet from the upper reaches of the wash of waves (20 feet for certain parcels) where construction and other coastal alterations are generally prohibited except by a variance procedure.

The Federal Coastal Zone Management (CZM) Act (Public Law 92-583) was signed into law in 1972. This Act affirms a national interest in the effective protection and development of the coastal zone and provides assistance and encouragement to coastal States to develop and implement rational programs for managing their coastal zones. In 1975, the Legislature enacted a Shoreline Protection Act which established such an interim program through a Special Management Area (SMA) extending a minimum of 100 yards inland from the shoreline vegetation or debris line. Guidelines to manage and protect the resources in the SMA were set forth by the Shoreline Protection Act. In 1977, the Hawaii Coastal Zone Management (CZM) Act became law and incorporated many of the features of the Shoreline Protection law and mandated objectives and policies for the management of Hawaii's coastal zone.

The Public Access Shoreline Hawaii (PASH) decision resulted from the implementation of the CZM and the SMA. This decision rendered by the Hawaii Supreme Court in 1995 unanimously upheld the validity of native Hawaiian gathering rights that were asserted by PASH and other individuals during the SMA permit proceedings before the County of Hawaii Planning Commission. The decision spoke to the standing of Hawaiian gathering rights and the governments' duty toward protecting those rights.

In addition to surface and coastal natural resources, the island also possesses sub-surface resources. Areas in Puna have been designated geothermal sub-zones for the development of geothermal energy and other areas of the island contain geological features such as lava tube caves.

Lava tube caves are among the island's more important geological natural resource. The island has thousands of lava tubes, but only a few are large enough to be lava tube caves. On Kilauea volcano, Kazumura cave is the longest lava tube cave in the world, at more than 30 miles long. Kaumana Cave is an important historic site, formed in the 1881 Mauna Loa lava flow. Other large lava tube caves exist on Mauna Loa, Hualalai, and possibly Mauna Kea.

Among the most significant of the island's natural resources are upland forests that provide the essential groundwater recharge areas. All groundwater sources in North and South Kona ultimately depend upon recharge that primarily occurs in a band between the 1,500 and 5,500-foot elevations. In the lower part of this band, rainfall

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dominates from approximately the 1,500 to 3,000-foot elevation. In the upper part of this band, above the 3,000-foot elevation, fog that collects on trees and drips to the ground is a major contributor to the aquifer. In recognition of the importance of the mauka Kona area for watershed and other environmental values, the County Council established a policy in Resolution No. 330-96 (1996) that no lands in North or South Kona above 2,500 feet in elevation (except in the existing Kaloko Mauka Subdivision) should be rezoned to lot sizes less than 20 acres, without a corresponding reduction in density on contiguous lands. In Kaloko Mauka, the Council found that the concerns could be mitigated by specific rezoning conditions which would require that at least 80 per cent of the property be kept in forest cover, in the area above 3,000 feet in elevation (Resolution No. 58-97). A similar concept was expressed in the conditions of rezoning for Kealakekua Development Company, which required an 8,000-acre forest management area in the mauka area of the property while rezoning the lower portion to a higher density.

### **8.2 GOALS**

- (a) Protect and conserve the natural resources from undue exploitation, encroachment and damage.
- (b) Provide opportunities for recreational, economic, and educational needs without despoiling or endangering natural resources.
- (c) Protect and promote the prudent use of Hawaii's unique, fragile, and significant environmental and natural resources.
- (d) Protect rare or endangered species and habitats native to Hawaii.
- (e) Protect and effectively manage Hawaii's open space, watersheds, shoreline, and natural areas.
- (f) Ensure that alterations to existing land forms, vegetation, and construction of structures cause minimum adverse effect to water resources, and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation, or failure in the event of an earthquake.

### **8.3 POLICIES**

- (a) Require users of natural resources to conduct their activities in a manner that avoids or minimizes adverse effects on the environment.
- (b) Encourage a program of collection and dissemination of basic data concerning natural resources.
- (c) Maintain the shoreline for recreational, cultural, educational, and/or scientific uses in a manner that is protective of resources and is of the maximum benefit to the general public.
- (d) Protect the shoreline from the encroachment of man-made improvements and structures.

- (e) Coordinate programs to protect natural resources with other government agencies.
- (f) Investigate methods of beach replenishment and sand erosion control.
- (g) Promote sound management and development of Hawaii's land and marine resources for potential economic benefit.
- (h) Encourage public and private agencies to manage the natural resources in a manner that avoids or minimizes adverse effects on the environment and depletion of energy and natural resources to the fullest extent.
- (i) Encourage an overall conservation ethic in the use of Hawaii's resources by protecting, preserving, and conserving the critical and significant natural resources of the County of Hawaii.
- (j) Encourage the protection of watersheds, forest, brush, and grassland from destructive agents and uses.
- (k) An identification and inventory of forest lands suitable for watershed purposes should be conducted jointly by County, appropriate State and Federal agencies, and private landowners.
- (l) Work with the appropriate State, Federal agencies, and private landowners to establish a program to manage and protect identified watersheds.
- (m) Encourage appropriate State agencies to review and designate forest and watershed areas into the conservation district during State land use boundary comprehensive reviews.
- (n) The installation of utility facilities, highways and related public improvements in natural and wildland areas should avoid the contamination or despoilment of natural resources where feasible by design review, conservation principles, and by mutual agreement between the County and affected agencies.
- (o) Encourage the continued identification and inclusion of unique wildlife habitat areas of native Hawaiian flora and fauna within the Natural Area Reserve System.
- (p) Encourage the use of native plants for screening and landscaping.
- (q) Develop policies by which native Hawaiian gathering rights will be protected as identified under judicial decisions.
- (r) Ensure public access is provided to the shoreline, public trails and hunting areas, including free public parking where appropriate.
- (s) Establish a system of pedestrian access trails to places of scenic, historic, cultural, natural, or recreational values.
- (t) Preserve and protect significant lava tube caves.
- (u) Ensure that activities authorized or funded by the County do not damage important natural resources.
- (v) Within the Kona high rainfall/fog-drip belt, ground disturbing activities such as excessive soil compaction and excessive removal of vegetative cover should be minimized and mitigated consistent with management strategies that encourage

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the retention of existing forested and pasture areas, reforestation, minimal coverage by impervious surfaces and other strategies that encourage effective infiltration to groundwater.

- (w) Implement Council Resolution Nos. 330-96 and 58-97 in land use approvals.
- (x) Create incentives for landowners to retain and re-establish forest cover in upland watershed areas with emphasis on native forest species.

## 8.4 STANDARDS

The following shall be considered for the protection and conservation of natural resources.

- (a) Areas necessary for the protection and propagation of specified endangered native wildlife, and conservation for natural ecosystems of endemic plants, fish and wildlife.
- (b) Lands necessary for the preservation of forests, park lands, wilderness and beach areas.
- (c) Lands with a general slope of 20 per cent or more that provide open space amenities or possess unusual scenic qualities.
- (d) Lands necessary for the protection of watersheds, water sources and water supplies.
- (e) Lands with topographic, locational, soils, climate or other environmental factors that may not be normally adaptable or required for urban, rural, agricultural or public use.
- (f) The Coastal Zone and Special Management Area as defined by statute and in accordance with the adopted objectives and guidelines.